King County Groundwater Protection Program

2003 Annual Report

King County
Department of Natural Resources and Parks
Water and Land Resources Division
Groundwater Protection Program

KING COUNTY GROUNDWATER PROTECTION PROGRAM 2003 ANNUAL REPORT

MARCH 31, 2004

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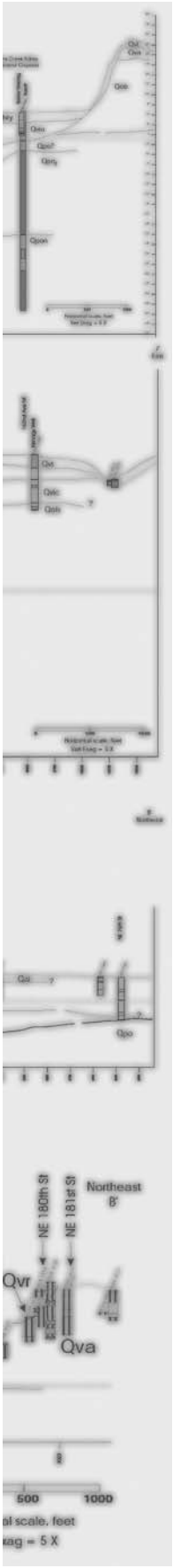
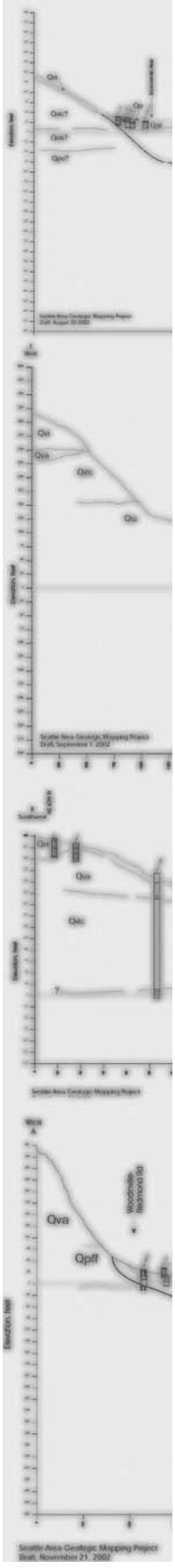




EXECUTIVE SUMMARY

The protection of groundwater against threats to its quality and quantity is critical to ensuring the long-term safety and reliability of water supplies for King County, Washington and its citizens. Groundwater is equally vital to humans, fish, wildlife and natural resources. The protection of groundwater is central to King County's commitment to environmental protection and the health and safety of our residents.

In 2001, the King County Council approved an ordinance that established the Groundwater Protection Program and named the Department of Natural Resources and Parks (DNRP) as the lead agency. Implementation of the program began in 2002. A primary focus of the ordinance was the establishment of locally based groundwater protection committees to oversee implementation of four certified groundwater management plans for Vashon-Maury Island, East King County, Issaquah Creek Valley and Redmond-Bear Creek Valley. By fall 2002, the members of all four committees had been appointed by King County Executive Ron Sims and confirmed by the King County Council. During 2002, Groundwater Protection Program staff also began working with the committees to prioritize each area's groundwater issues and management activities.

By January 2003, all four Groundwater Protection Committees were established, and two years of ambient monitoring had been completed in each of the Groundwater Management Areas. 2003 was the year to put these committees and this information to work.

In 2003, the Groundwater Protection Program was successful in achieving the following outcomes:

- Developed and reviewed funding alternatives for groundwater protection services. Made decision to pursue cost-shared interlocal agreements for the near-term.
- Completed scope and began implementation of the first comprehensive water resources evaluation for one of the Groundwater Management Areas (Vashon-Maury Island).
- Conducted two mandated internal reviews of the program (King County Auditor's Office and Regional Water Quality Committee).
- Provided staff liaison services and management for four groundwater protection committees for the first complete year.
- Convened a special ad-hoc advisory group, which met quarterly, to help identify priorities and to scope the future of the program.
- Revised King County's Critical Aquifer Recharge Areas (CARA) ordinance and proposed its integration into the county Critical Areas Ordinance (CAO).
- Issued King County's first Best Available Science report to support the proposed changes and direction in CARA.
- Finalized a data management plan to guide future scientific data collection and analysis related to groundwater.
- Reorganized and consolidated the program within the King County Department of Natural Resources and Parks so all primary staff are within the Water and Land Resources Division.
- Continued focused groundwater sampling and analysis along the Sammamish River to address specific issues related to groundwater quality, fish habitat and water temperature.
- Presented groundwater protection information to 4,515 students in 58 schools, and at a variety of festivals, fairs and other community events throughout King County.
- Assisted in the update and public review of the draft South King County Groundwater Management Plan.

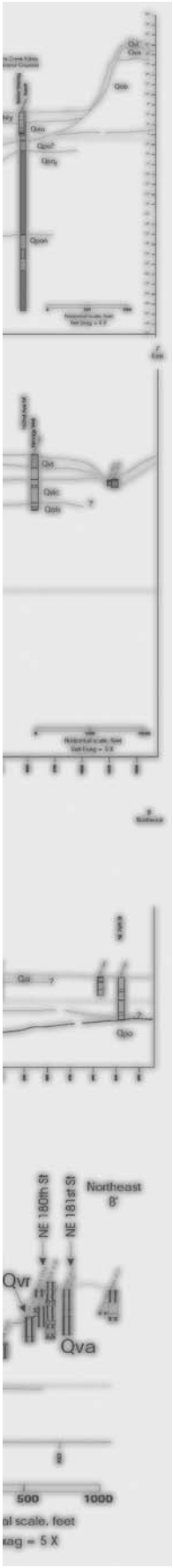
- Assisted in revising comprehensive plan provisions regarding protection of groundwater as one element of utility service delivery under the Growth Management Act.
- Coordinated with Public Health – Seattle & King County on groundwater-related topics, such as on-site septic systems and exempt wells.
- Coordinated with the King County Department of Development and Environmental Services (DDES) on new development review.

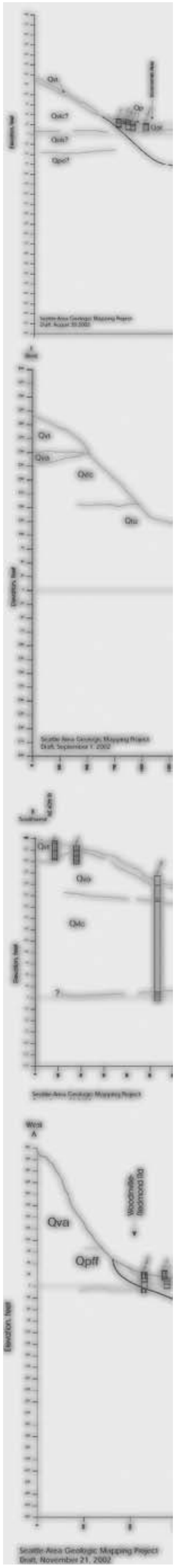
In 2004, the Groundwater Protection Program will continue its provision of valuable services and will seek to accomplish the following outcomes:

- Conclude the final year of Groundwater Protection Committee operations as outlined in the Groundwater Protection Ordinance.
- Publish plan update reports from each of the Groundwater Protection Committees for each of the groundwater management plans; these would include documentation of the accomplishments of the committees over the past two years.
- Develop future work programs for each individual Groundwater Management Area (GWMA).
- Negotiate interlocal agreements to help fund GWMA-based priorities in 2005 (and 2006).
- Define appropriate roles for key departments involved in provision of groundwater services (DNRP, DDES, Public Health – Seattle & King County, and the Local Hazardous Waste Management Program) in response to County budget provisos.
- Finalize review of the South King County Groundwater Management Plan and determine future King County role.
- Implement the first year of the Vashon-Maury Island Water Resources Evaluation.
- Complete the third year of the Sammamish River Valley Groundwater Project investigation.
- Expand public access to Web-based groundwater quality and quantity data.
- Consider revisions to existing King County groundwater policies and regulations.
- Improve coordination of groundwater education services with local partners.

These outcomes will be pursued in 2004 with the understanding that program funding in 2005 will shift from the current DNRP funding to a negotiated budget funded in part by local partners.

New partnerships will be essential to maintaining and protecting King County's groundwater resources into the future. The Groundwater Protection Program is committed to providing value to King County residents through effective groundwater protection services.

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Draft, November 21, 2002

CHAPTER 1: INTRODUCTION

The purpose of this report is to provide a summary of groundwater protection activities performed in 2003 by the King County Groundwater Protection Program. This report also fulfills the requirement of King County Code 9.14.050 that the King County Department of Natural Resources and Parks (DNRP), as lead agency for the program, report program activities on an annual basis.

Background

For many years, groundwater protection and related groundwater management activities have been an important part of King County's public health and environmental stewardship responsibilities. Public Health – Seattle & King County (Public Health) administers programs related to safe drinking water and on-site septic systems as part of its public health responsibilities. Since its creation, and as part of the King County/Metro merger in 1996, DNRP has been involved in groundwater protection as part of its natural resources management and its environmental protection mission.

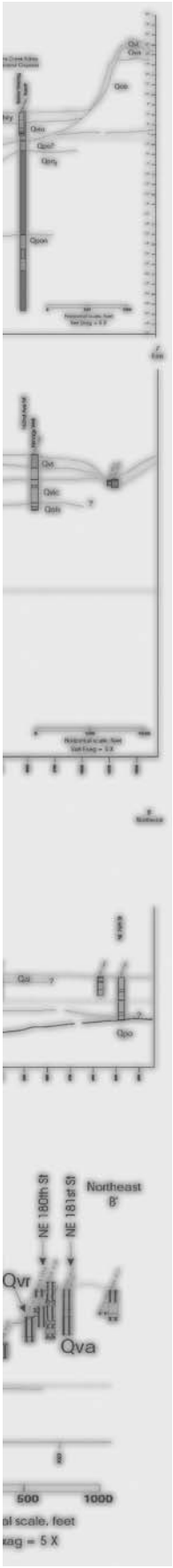
Beginning in 1986 Public Health and DNRP worked closely with locally established committees over a 10-15 year period to develop the groundwater management plans for five Groundwater Management Areas (Map 1) in King County. Five geographically specific advisory committees were created to address each distinct geographic area's needs. Significant problems that threatened groundwater resources were identified in the five areas. The King County Council approved four of the plans in 1998. These plans were then certified by the Washington State Department of Ecology (Ecology) in 2000. In 2001 the King County Council agreed to three years of interim funding to DNRP to coordinate implementation of the plans and to staff and manage the committees.

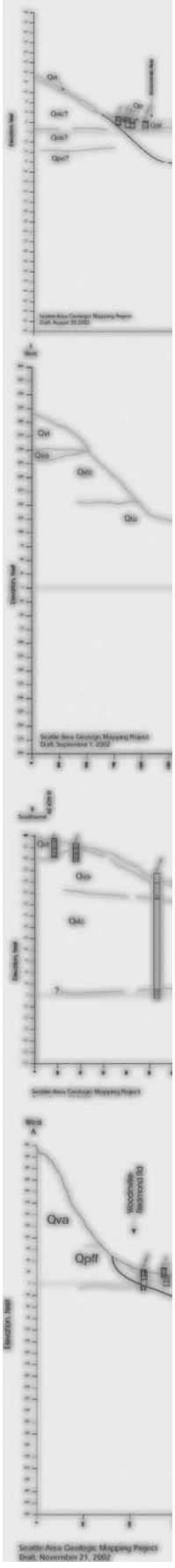
It was partly in response to this need for coordinated plan implementation that the King County Council created an ordinance for a groundwater protection program in King County. The ordinance was adopted in October 2001 and went into effect in December 2001 (the full text of the ordinance is available on the Web at http://www.metrokc.gov/mkcc/Code/ (see Title 9, Section 9.14). The ordinance named DNRP as the lead agency for all groundwater-related work within King County. The ordinance also identified specific responsibilities for the program and directed DNRP to coordinate the county's groundwater protection services with other county departments – such as Public Health and DDES – and with federal and state agencies. The ordinance created groundwater protection committees for each of the four Groundwater Management Areas with Ecology certified groundwater management plans. The ordinance directed DNRP to assist in organizing committees and to provide staff support using available resources.

With this interim funding, the DNRP program has focused on public education and outreach, data collection analysis and management, policy and regulatory development, and coordination among related county efforts affecting groundwater protection. DNRP also developed and strengthened relationships with state agencies, such as Ecology and the Department of Health, and federal agencies, such as the Environmental Protection Agency and the United States Geological Survey. In addition, DNRP established four local groundwater committees, as proposed by each Groundwater Management Plan, to coordinate plan implementation.

Current Program

In 2002, Groundwater Protection Program staff developed a mission statement and organizational structure that reflected the new direction provided by the Groundwater Protection Ordinance. These elements continue to guide program activity.





Mission Statement

The Groundwater Protection Program provides management, policy and technical expertise to help protect the quality and quantity of the groundwater resources in King County. The program seeks to protect the health and viability of county residents who use groundwater for drinking and to preserve fish and wildlife habitat by ensuring the replenishment (by way of groundwater contributions) of streams, lakes and wetlands for future generations.

Goals

- Ensure that King County exercises all of its authority in a fashion that protects groundwater quantity and quality.
- Develop the capability to assess groundwater quality and quantity trends and conditions.
- Facilitate stakeholder engagement in groundwater issues and related decision-making processes, and build a strong base of support for groundwater protection by encouraging communication and dialogue among stakeholders.

Primary Responsibilities

1. Interagency Coordination
Coordinate and collaborate within King County government and with other local, state, federal and tribal agencies in order to leverage resources, integrate groundwater protection with the protection of all water resources, and integrate groundwater protection with other public health and safety efforts.

2. Groundwater Protection Planning and Plan Implementation
Help local communities identify groundwater protection needs and address these needs with local and non-local resources. Integrate groundwater issues with other local planning efforts including growth management plans.

3. Data Collection and Management
Serve as a reliable source of technical data regarding the quality and quantity of King County's groundwater resources; develop effective monitoring programs to document trends and provide expert analysis on the conditions of groundwater quality and quantity in King County for planning and other purposes.

4. King County Groundwater Policy
Foster (review, develop, recommend) effective groundwater protection policies for King County.

5. Groundwater Stewardship and Education
Provide stewardship services related to groundwater protection, and communicate to the larger community both the important groundwater issues in King County and what is being done to address them.

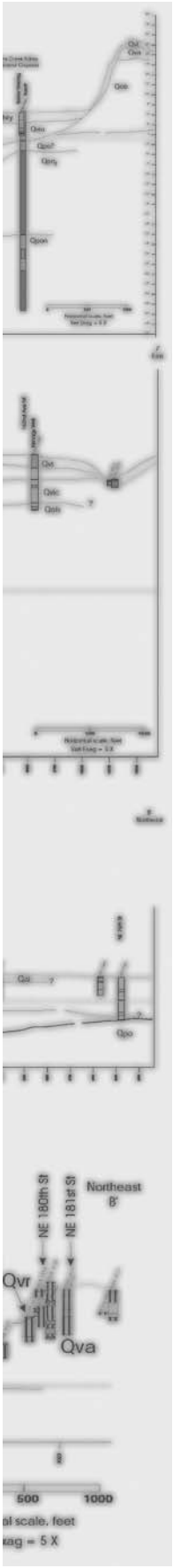
6. Program Administration and Accountability
Perform general administrative activities for the Groundwater Protection Program. Inform decision-makers about important groundwater issues in King County, and report on what is being done to address these issues. Evaluate and develop funding sources for stable, long-term groundwater protection in King County.

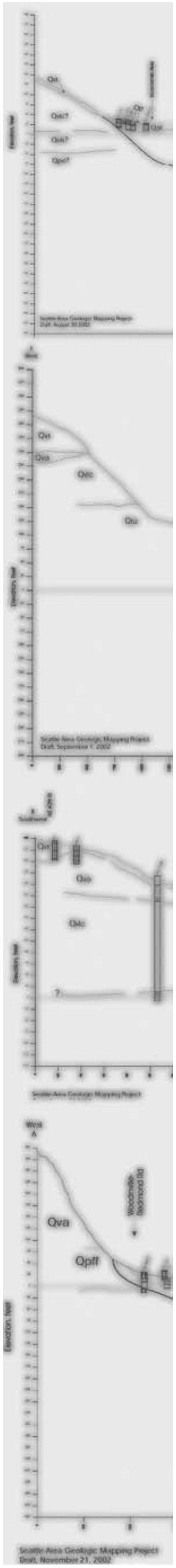
Program Focus

In 2001, the Groundwater Protection Program had residual staffing and funding levels from the "Early Start" program that was authorized by the King County Council in 1999. Services focused on ambient monitoring, education and creation of the Groundwater Protection Ordinance.

In 2002, the program's organization shifted in response to the Groundwater Protection Ordinance. Most importantly, King County staff facilitated convening the Groundwater Protection Committees and expanded the groundwater services available.

In 2003, the program focused on three areas: providing science, policy and education services within those Groundwater Management Areas that had active groundwater protection committees; researching the feasibility of providing regional services across the county; and evaluating potential long-term permanent funding sources for a combined program of local and regional services. Additional work was done for high priority regional or countywide projects with critical groundwater components.

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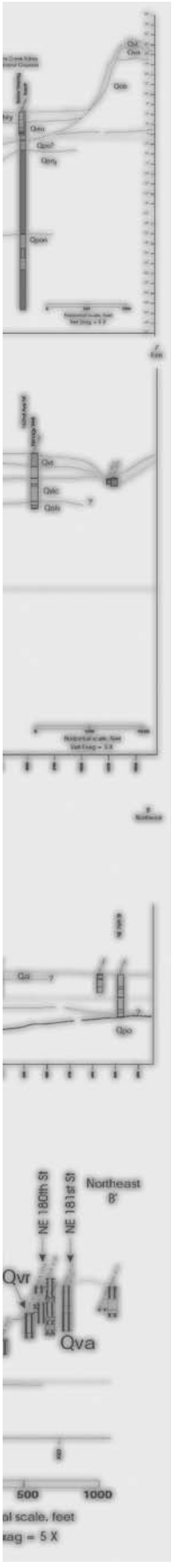
CHAPTER 2:
GROUNDWATER PROTECTION SERVICES

As the lead agency for the King County Groundwater Protection Program, the Department of Natural Resources and Parks (DNRP) maintains partnerships with the numerous federal, state and local agencies that have specific responsibilities for groundwater protection in King County. This report, however, emphasizes the role of DNRP in groundwater protection.

DNRP's groundwater protection services are grouped into six categories, five of which are discussed in this chapter:

1. Data Collection and Management
2. Groundwater Stewardship and Education
3. Groundwater Protection Planning and Plan Implementation
4. Groundwater Policy
5. Interagency Coordination

The sixth area of program service – Program Administration and Accountability – is discussed in Chapter 3.



Data Collection and Management

Program Accomplishments

Data collection and management for the Groundwater Protection Program in 2003 included work in three major areas: on-going groundwater technical services, groundwater investigations and ambient monitoring. Major 2003 accomplishments in these areas are detailed below.

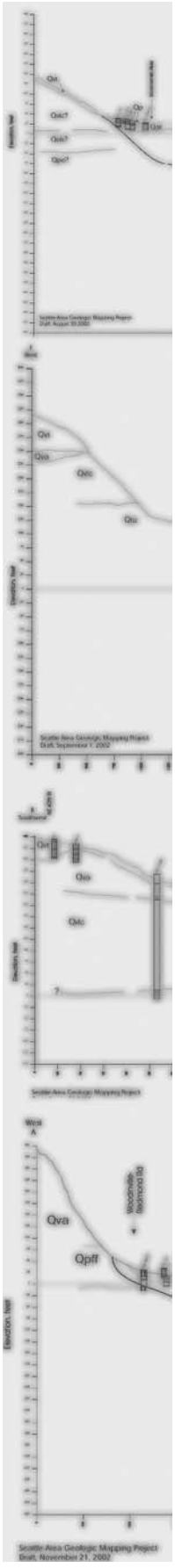
On-going Groundwater Technical Services

- Provision of technical services on an on-going basis helps to support the management and protection of groundwater resources.

The Groundwater Protection Program continued to provide technical groundwater support to the public and other county departments, divisions and groups. The most important accomplishment in 2003 was the completion of a Best Available Science (BAS) document on Critical Aquifer Recharge Areas (CARA). The BAS document supported substantial updates to regulatory standards for protecting CARAs, as part of the Critical Areas Ordinance (CAO) update. This BAS document was peer-reviewed by hydrogeologists from state and county agencies and the environmental consulting community. The initial release of the BAS document for public review occurred in October 2003. A second public review of this document is expected in early 2004.

The CARA BAS report reviewed methods for designating CARA and identified and assessed land use activities that can adversely affect groundwater. Key findings of the CARA BAS report include the following:

- The King County proposed CARA designations are based on both aquifer susceptibility and source protection perimeters which is an accepted method used throughout the world to protect groundwater. This method could be further refined by the addition of topographic information and localized recharge parameters. Additionally, the source protection perimeters could be improved in those cases where a fixed-radius method was used; efforts should be made to map these areas using more sophisticated three-dimensional modeling. CARA designations may need to change as more detailed information about an area is developed.



- Prohibiting polluting land-use activities in areas susceptible to groundwater contamination is one of the best available methods for protecting groundwater quality. For example, the nature of the contaminants associated with activities such as landfills, wrecking yards, wood treatment, and metals mining make it wise to take a precautionary approach to siting these facilities. Additionally, it was noted that certain land uses can have limited environmental impacts if appropriate technology is used to mitigate these impacts.

Groundwater Protection Program technical staff continued to evaluate new development projects that have the potential to affect groundwater resources. This actively involved working with the King County Department of Development and Environmental Services (DDES) and the Wastewater Treatment Division (WTD) and the Solid Waste Division (SWD) of DNRP. For DDES, program staff reviewed several land use application packages, met with applicants, and proposed mitigation for several new developments in King County. They worked with WTD to improve the analysis of groundwater issues for the proposed Brightwater regional wastewater facility, as well as a proposed treatment plant and possible upland discharge in Carnation. For SWD, a sampling and analysis plan was developed for domestic water supply wells near the Duvall Custodial Landfill site. In addition, the program's technical staff worked with other sections of the Water and Land Resources Division on projects such as the Auburn Narrows Wetland Project. Program staff also responded to special data requests from the general public, utility agencies and the business community.

Groundwater Investigations

- Groundwater investigations look at specific geographic areas of concern to improve the conceptual understanding of the groundwater hydrology and facilitate management decisions.

The Groundwater Protection Program's technical staff continued to participate in local groundwater investigations that addressed issues and concerns regarding groundwater quality and quantity around King County. In 2003, work continued on the Sammamish River Valley Groundwater Project. This study is intended to inform management decisions for mitigating flow and temperature problems in the Sammamish River between Lake Sammamish and Lake Washington and to guide the development of reclaimed water projects in the river corridor. This project reached the following major study milestones in 2003:

- Six additional monitoring wells were drilled, installed and developed (in addition to the 15 installed in 2002).
- Two rounds of water quality sampling were done in all of the monitoring wells.
- Pumping tests were done at two monitoring wells to estimate aquifer properties.
- Continuous water level data were collected at 21 sites for the entire year.

A work plan for the Vashon-Maury Island Water Resources Evaluation was completed in 2003. This groundwater investigation was designed to provide a scientific evaluation of the water supply issues related to both water quantity and quality on Vashon-Maury Island. Work elements included in the evaluation were monitoring of groundwater quality and quantity, construction of a detailed groundwater flow model in three phases, and coordination with the community and other compatible work efforts.

Ambient Monitoring

- Ambient monitoring provides important information on the state of the groundwater by allowing for the evaluation of changes in groundwater quality and quantity over time.

In 2003, King County's ambient monitoring program focused on two of the four certified Groundwater Management Areas (GWMA). Two rounds of samples were collected in the Vashon-Maury Island GWMA and one round was collected in the East King County GWMA. The King County Environmental Laboratory analyzed the samples for a long list of elements. Staff monitored the same GWMA sampling locations as previous years in order to track long-term changes.

Staff worked with volunteers on Vashon-Maury Island to collect water level information. The volunteers committed to monitoring water levels in their wells frequently so that King County could have sufficient data to identify water level trends.

The program's science staff also developed a working draft of a Data Collection and Management Plan to provide an overall context for the following:

- groundwater modeling
- long-term groundwater monitoring
- on-going technical services
- groundwater investigations
- organization and dissemination of data.

The recommendations from this planning helped shape the 2004 scope of work as described below.

State of the Groundwater

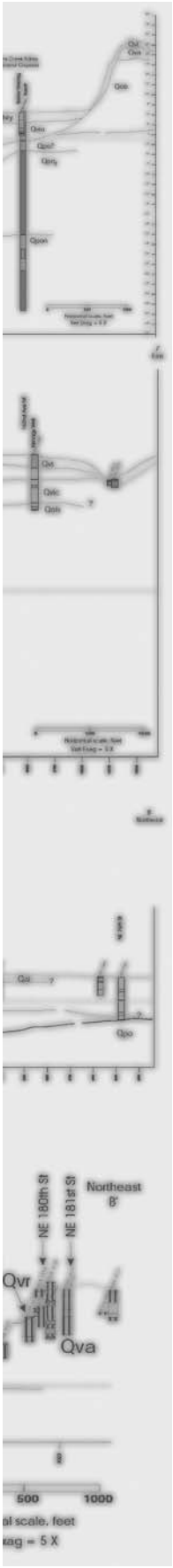
An important service that the Groundwater Protection Program provides is the assessment of possible threats to groundwater quality and quantity. The main sources of data to be used for these assessments are the ambient monitoring network, volunteer water level measurements, and local and state public health databases. The ambient monitoring wells were originally selected for the characterization needs of the groundwater management plans and were intended to be representative of the various locations, depths and aquifers where groundwater is obtained. The volunteer water level wells were self-selected and are all on Vashon-Maury Island. Well owners on the island volunteered to measure water levels in spring 2001. While initially these wells were monitored for a year, a few of the volunteers have continued to provide water level information.

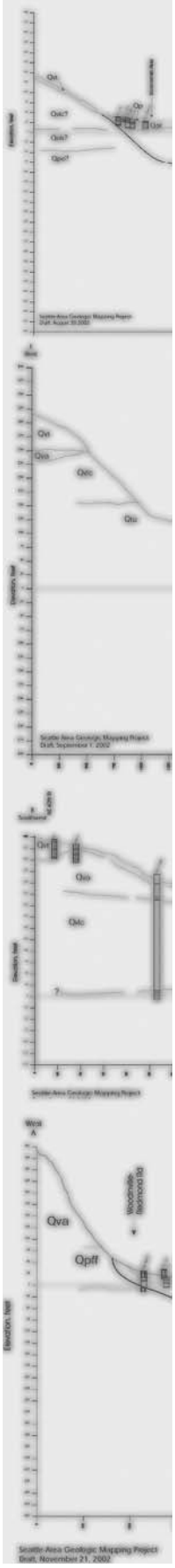
During 2003, the Groundwater Protection Program's science staff presented the results of all monitoring efforts to the Groundwater Protection Committees. While some of these results are tailored to the specific area, many of the interpretations and conclusions are general to King County.

Water Quality

In regard to water quality, most of the data relate to 33 inorganic elements that were measured in the water samples. These elements include major ions, such as alkalinity or calcium which are found at levels of 10–100 mg/l (milligrams per liter), and trace elements, such as mercury or cadmium, which were not detected even at method detection limits of 0.0001 mg/l. The results of the testing were compared against drinking water standards. Three inorganic elements came close to these limits:

- arsenic
- nitrate
- lead





Arsenic exceeded drinking water standards of 0.01 mg/l at 11 of the 68 ambient monitoring wells throughout the monitoring program. This is a new drinking water standard as of 2001 (the previous limit was 0.05 mg/l), and it will not be enforced for most water supply wells until 2006. The highest arsenic concentrations were generally found in the deeper wells, apparently related to naturally occurring arsenic in glacial deposits and bedrock. In addition, arsenic concentrations do not appear to have changed since the groundwater management plans were first implemented in 1989-1992. The arsenic concentrations are also correlated with phosphorus, which further indicates that it's most likely a natural occurrence. Exposure to arsenic in water supply wells is a major public health concern and is reported by purveyors regularly to the state Department of Health. Locations of the wells that exceeded 0.01 mg/l are shown on Map 6.

Average nitrate concentrations in 2003 did not change significantly from the 2002 averages at any of the ambient monitoring wells. None of the samples exceeded drinking water standards. Nitrate, more than arsenic, often differs greatly in concentration from one season to the next in the same well, so an average concentration is used as an indicator for long-term changes. High nitrate concentrations, which are normally found in shallow wells, are probably due to nitrate releases from decaying vegetation, septic system drain fields and/or agricultural applications. The specific causes of high nitrate concentration are still under investigation. Nitrate is also a public health concern, and purveyors are required to analyze and report on it frequently. Locations where nitrate is commonly found at high levels (over 5 mg/l, or half the drinking water standard) are shown on Map 7.

None of the ambient monitoring wells had average lead concentrations that exceeded the drinking water standard of 0.015 mg/l. As indicated in the 2002 benchmark report, lead concentrations appear to be significantly lower now than during the 1989-1992 sampling period. Lead concentrations are more inconsistent than nitrate, often changing from one sampling period to another in the same wells. In fact, in duplicate samples – samples taken in the same well, one immediately after the other – lead analyses had high "relative percent differences." This is also true of a few other elements – copper, zinc, iron and nickel – which indicates that the high levels observed are probably due to minuscule particles flaking off from plumbing components such as valves. While sampling protocols are being used to minimize this problem, it is not completely avoidable as long as water supply wells are used for the sampling.

Concentrations of the major ions are also being used to characterize King County groundwater through geochemistry. The time that groundwater takes to travel from its point of recharge to the well that is sampled or from its point of recharge to its discharge to a stream or lake is often several years. During that time, the water reacts with or takes on some of the chemical characteristics of the aquifer materials through which it travels. Because the travel times for water flowing to or from deeper aquifers are usually longer, these aquifers have different characteristics. In general, the older the water, the more it changes from "hard" water (with calcium and magnesium) to "soft" water (with more sodium and potassium). It also changes from having chloride and sulfate ions to having more bicarbonate ions. Such geochemical characterizations are still being investigated.

Water Quantity

Water quantity was measured in some of the ambient monitoring wells where access allowed for water level measurements. However, because of the great changes in water levels (in some cases, several feet) over the year, it is very important to get water level measurement data on a more frequent basis than was possible for the ambient wells.

On Vashon-Maury Island, water level data were obtained by training and equipping a cadre of volunteer well owners. Program staff also obtained data for several additional wells on Vashon-Maury Island that are being monitored by or for the state Department of Ecology.

Some of these hydrographs (graphs charting water level vs. time) appeared to show systematic declines in water level over the last couple of years. This observation led to a more detailed investigation into the possibility that the groundwater on Vashon-Maury Island is being "mined," or consumed at a higher withdrawal than it is being replenished by natural recharge. Detailed investigation and monitoring of water levels in the other Groundwater Management Areas has not been initiated.

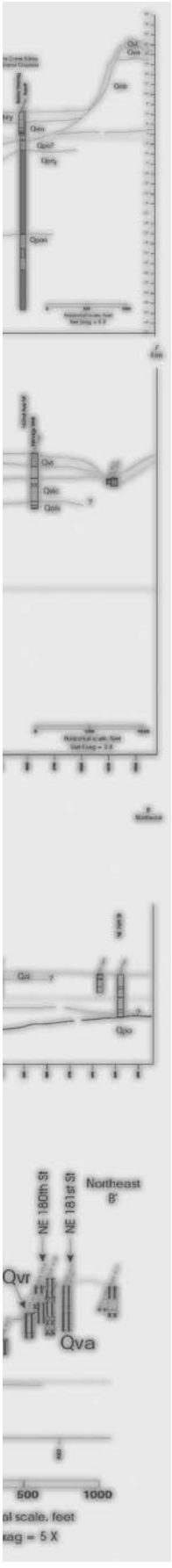
In order to determine if water level changes are significant, the data were subjected to statistical analysis. However, a statistically significant trend line is sometimes indistinguishable from a temporary run ("drift") of highs or lows. None of the data series tested showed a statistically significant trend line (at a 95% confidence level), using an ARIMA difference method that tests for trends. The conclusion at this time is that the changes in water level are due to drift.

To put the data into perspective, a simple recharge model was developed to compare today's recharge rates with what may be occurring at other times. The recharge model was based on methods developed for the United States Geographical Survey Deep Percolation Model and included simple representations of soil moisture storage, evapotranspiration, runoff, and leakage down to the aquifer. Material properties were taken for a till soil (Alderwood soil series) which is typical in upland areas, both on Vashon and across the Puget Sound basin. Precipitation was obtained for SeaTac airport for the period October 1948 to February 2004. This simple recharge model predicted the following:

- Long-term recharge (1949-2003) for western King County including Vashon-Maury Island is about 7.1 inches per year (in/yr)
- During the Groundwater Management Plan study period (1989-1992) the corresponding recharge rate is estimated as 6.8 in/yr—similar or slightly lower than the estimated long-term rate
- A brief drought period (5.2 in/yr for 1993-1994) and a wetter period (7.7 in/yr in 1995-2000) followed
- During the ambient monitoring and volunteer water level monitoring (2001-2003), the recharge rate was estimated as 6.5 in/yr, well below normal and particularly low at the beginning of this period.

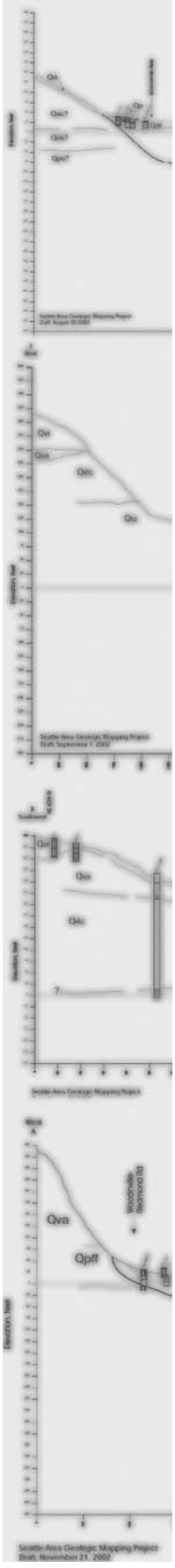
The model that is described here is very preliminary. It is a first step toward a series of more comprehensive models that will be developed as part of the Vashon-Maury Island Water Resources Evaluation. Subsequent models may provide a better estimate of the long-term sustainability of the groundwater resources, always with the assumption that climate will not change markedly from historic rates.

Water levels have also been a major focus of the Sammamish River Valley Groundwater Project (see Groundwater Investigations above). In this study area, dedicated monitoring wells could be studied intensely to show flow directions and detailed seasonal changes. The groundwater is dominated by levels in Sammamish River, Lake Sammamish and Lake Washington, and it flows into and along the river. Deep aquifers provide flow upward (artesian) into the valley and river. Additional analysis is currently being applied to these data and will be published in a Sammamish River Valley Groundwater Project report in 2004.



Looking Ahead – Major 2004 Data Collection and Management Efforts

The Groundwater Protection Program (GWPP) has a number of activities scheduled for 2004 in Data Collection and Management. These activities include the following:



- **On-going Technical Groundwater Services** – The GWPP will continue to provide technical groundwater support to the public and other county departments, divisions and groups.
- **Groundwater Investigations** – The Sammamish River Valley Groundwater Project will continue with water quality and quantity monitoring in 2004 and will publish data in a report. Work will begin on the Vashon-Maury Island Water Resources Evaluation in 2004. The major anticipated deliverables for both of these investigations is groundwater flow models of the study areas. Also, a groundwater investigation work plan will be developed in 2004 for East King County.
- **Ambient Monitoring for Groundwater Quality and Quantity** – Collection and analysis of groundwater samples will continue in the same Groundwater Management Areas (Vashon-Maury Island and East King County) as in 2003.
- **Organization and Dissemination of Data** – The development of an interactive Web site will begin in 2004. The King County Interactive Groundwater Database Web site will utilize Internet-based mapping technology to significantly improve internal and external access to groundwater data.

Groundwater Stewardship and Education

Public Awareness

The stewardship and education components of the Groundwater Protection Program center on improving public awareness of groundwater issues. A wide variety of communication tools are utilized to help citizens learn about, and better understand, King County's groundwater quality and quantity issues. Classroom presentations and staff appearances at fairs, festivals and community meetings also serve to educate citizens and encourage a meaningful community dialogue about groundwater resources. The intent is to provide citizens with the information that they need to make thoughtful decisions that will help to protect groundwater quality and quantity in King County.

At the February 2003 Groundwater Protection Committee Chairs Meeting, public education was listed as one of the top two priority services that should be provided by King County. Committee members identified public education as a great investment, encouraged the distribution of information and educational materials through water and sewer utilities, and supported public education and information as a key value-added service.

A review of all King County education programs in the Department of Natural Resources and Parks (DNRP) was conducted during the first quarter to identify suitable partners to incorporate a groundwater protection message in their public outreach. A comprehensive list of existing education resources that promote groundwater messages was developed and distributed to all review participants. Information on county staff and partners, classroom presentations, targeted audiences, curriculum, and information materials were compiled for the following education based programs: Waste Reduction/Recycling and outreach in the Solid Waste Division and Local Household Hazardous Waste, Water Quality Awareness and groundwater education in the Water and Land Resources Division. Since the education program at Public Health – Seattle & King County was relevant, it was also included. The document now serves as a directory for anyone wishing to collaborate with King County on groundwater related stewardship and education projects. It is available via the Groundwater Education Web site.

A groundwater education Web site was created and launched during the second quarter of 2003. Descriptions of groundwater and the water cycle can be found on the King County Web site at: http://dnr.metrokc.gov/wlr/pi/groundwater/. This new Web page complements the existing King County groundwater management information currently online. Links to other educational, environmental and stewardship sites have been established. Educators will find information on classroom presentations, videos and educational sites for students.

“Protecting Water Resources” was the theme for Earth Day 2003. Capitalizing on that theme, DNRP issued a news release announcing the publication of the 2002 Groundwater Annual Report and information on the Groundwater Protection Program and the Groundwater Protection Committees. Information about protecting groundwater resources was also included.

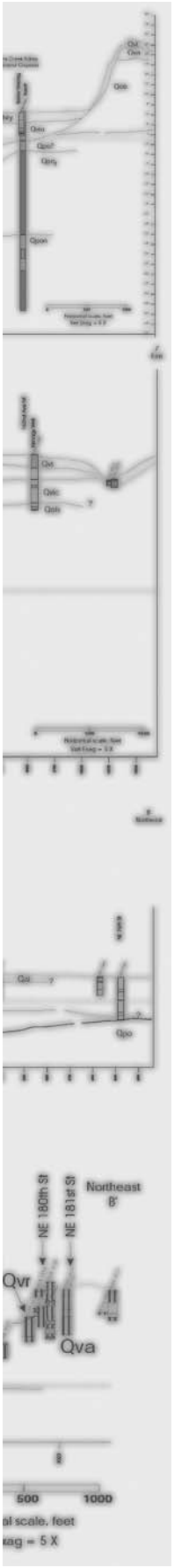
In the fall of 2003, King County conducted its annual Water Quality Survey to measure citizen attitudes and perceptions. A random selection of King County residents were polled and for the first time ever, citizens were asked if having a program that aims to protect groundwater from excessive use is a good use of public money. Results showed over 75% of those polled agree it is a good use of public money. When citizens were asked an open-ended question on the most important environmental issue facing our region today, pollution and water quality issues rated as the highest single concern of 26% of the respondents. Of those people surveyed, 69% think King County government provides groundwater management services and over 75% feel the county is doing a good to fair job of providing that service. This survey provided valuable feedback to the Groundwater Protection Program.

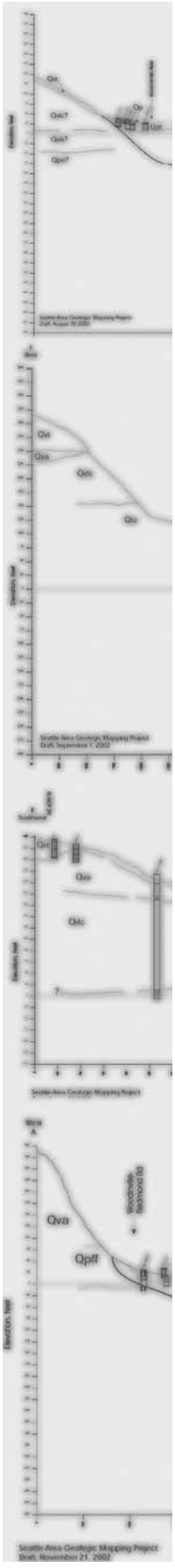
In December, 2003 Issaquah Creek Valley, East King County and Redmond-Bear Creek Valley Groundwater Protection Committee members were asked what media would work best for communicating a groundwater protection message. Responses were varied. In 2004, DNRP plans to develop a groundwater brochure that will illustrate who in King County is using groundwater, what groundwater is used for, and why it must be protected and conserved in the future. Once completed, the brochure will be made available to all groundwater users and partnerships and will also be posted on the Groundwater Education Web site.

DNRP staff, in partnership with the Groundwater Protection Program, applied for a Puget Sound Water Quality Action Team Public Involvement and Education (PIE) grant to fund a flash animation Web page called “Little House on the Sewer.” While the proposal was not selected for funding, DNRP will begin storyboard development in 2004 and continue to seek funding. The first episode will illustrate the pipe connections between a house and the public wastewater treatment plant. Subsequent episodes will cover the mechanics of private septic systems, sewer conveyance system in-flow and infiltration issues affecting groundwater quality and quantity, and biosolids use in agriculture. The first episode can be incorporated into wastewater treatment plant tours given to students.

General groundwater conservation, protection, information and other brochures are free to the public and made available to the public during fairs and festivals. Pamphlets covering a wide variety of topics including the following are available:

- local groundwater management plans
- groundwater and drinking water
- EPA guide to groundwater protection
- household hazardous waste disposal
- natural landscaping, gardening and yard care
- care, maintenance and landscaping for people responsible for on-site sewage septic tank systems
- water conservation
- activity books for children.





Among the most popular publications at community events were DNRP's "Grow Your Own Native Landscape," a guide to identifying, propagating and landscaping with Western Washington native plants, and Public Health – Seattle & King County's brochure covering on-site septic systems for homeowners.

Classroom Presentations

In 2003, Washington State's Centennial Clean Water Fund covered half of the costs for the Groundwater Education Program. During the 2002–2003 school year 4,515 students in 16 King County School Districts received groundwater presentations. Groundwater Education staff visited a total of 58 schools and 170 classrooms locations shown in Map 5. Students participated in an interactive skit that mimicked the water cycle and added various liquids (represented by different colored dyes) to a groundwater model to learn important lessons about aquifers and how their personal actions can affect water conservation and contamination. At the end of the presentation, students were asked to inventory their own water usage at home. Classroom presentations were approximately one hour long. Teachers were left with a packet of reference materials containing groundwater quality and quantity protection themes.

Community Events

Providing educational booths at community fairs and festivals is another way that DNRP communicates its groundwater protection message to the community. Participants are encouraged to ask questions, give feedback and take home free information materials. Interactive exhibits allow citizens the opportunity to discuss groundwater with staff. A groundwater model shows the relationship of life above the ground to the water below the ground, and brochures covering an array of groundwater related topics are on hand. Map 5 shows the location of this year's events.

Program staff also provided technical presentations at the request of local groups. Program staff responded to over 100 inquiries from the public on a variety of topics including the following:

- A neighbor built a horse barn over a stream. Can this be a water quality problem and what can I do about it?
- A natural gas pipeline is being built nearby. Will this affect the area's groundwater?
- We found what we think is an old well near a creek. How can we find out how deep it is and how to decommission it?
- Does hardness (e.g. calcium) in our well water contribute to kidney stones?

King County staff served on the Water Conservation Coalition of Puget Sound's Committee on Youth Education. The coalition is made up of water suppliers from South Puget Sound to the state border with Canada. Deliverables include the following:

- **Aqua Pals** – a pen pal program for schools, or youth groups, in different parts of the state, country and/or world to exchange ideas about water issues in their respective areas.
- **Water Education Grants** – $3,000 in grants awarded to local school programs.
- **Water Utility Educator Workshop** – a workshop for "professional" water people who give classroom presentations in their local service area schools was presented to the general membership.
- **Haiku Contest** – development of a water related Haiku contest for local schools.
- **Web site** – the teacher oriented portion of the coalition's Web site: http://www.bewatersmart.net.

Groundwater Protection Planning and Plan Implementation

Groundwater Protection Committees

The King County Council has established four groundwater protection committees, one for each of the following areas: Vashon-Maury Island, East King County, Issaquah Creek Valley and Redmond-Bear Creek Valley. Each of these areas is certified by the Washington State Department of Ecology. Under the provisions of the Groundwater Protection Ordinance, each of the four committees will remain in existence through December 31, 2004. In 2004, program staff will work with each of these committees and the King County Council to determine the committee's future.

The King County Council did not create a committee to cover the South King County Groundwater Management Area as there was no adopted groundwater plan for that area. However, a Draft South King County Groundwater Management Plan was published in 2003 by the South King County Regional Water Association in coordination with the South King County Groundwater Advisory Committee.

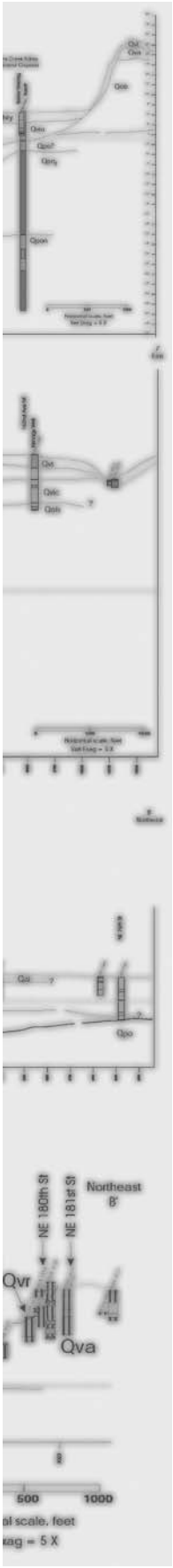
In 2003, all four Groundwater Protection Committees met regularly to consider their responsibilities as outlined in the Groundwater Protection Ordinance. Committee membership includes representation from local governments, water and sewer purveyors, businesses, agriculture, and environmental and residential well users. Each tribal nation with federally recognized rights within a Groundwater Management Area is invited to participate as well. The state departments of Ecology and Health, adjacent county governments, and Public Health – Seattle & King County are each invited to participate as non-voting members.

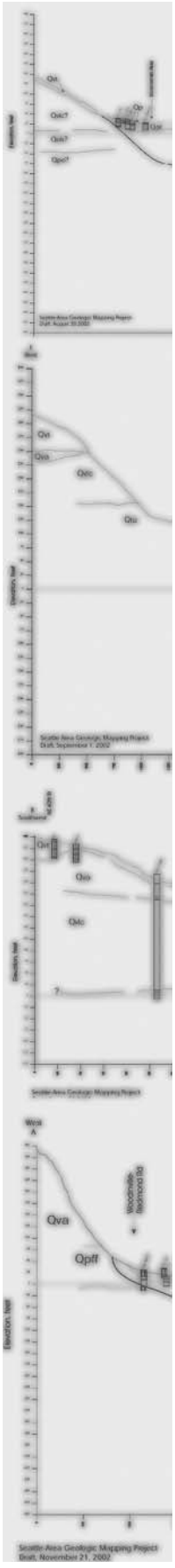
Each committee has a number of responsibilities spelled out in KCC 9.14 including the following work:

- Advise the King County Executive and King County Council on groundwater activities and issues, and keep elected officials and their organizations informed.
- Monitor and participate in the implementation of groundwater management plans, and develop and recommend modifications to the plans.
- Review and make recommendations on short- and long-term work plans for regional groundwater needs.
- Coordinate community groundwater needs with local organizations.
- Provide annual status reports on their activities.
- Make recommendations on distribution and use of aquifer protection funds.
- Recommend changes to county planning policies affecting groundwater protection.
- Recommend services tailored to the unique needs of the local area.
- Provide advice on state groundwater regulation.

Status reports for each of the committees' activities is included in this report as Appendix B. In 2003, most committees generally focused their efforts on reviewing critical local groundwater issues (including proposed new groundwater regulations), reporting on the actions taken since the plans were adopted, and working as a group to identify priorities for future actions.

Additionally, Groundwater Protection Program staff convened several joint meetings of the chairs and vice chairs of the committees to discuss the overall county program and solicit preferences on future funding alternatives (see Chapter 4 for more information on funding analyses and service priorities).





Groundwater Planning Under the Growth Management Act

In addition to the groundwater planning activities occurring within the Groundwater Protection Committees, the Department of Natural Resources and Parks also developed groundwater-related amendments to the King County Comprehensive Plan in 2003. Program staff provided draft language and coordinated with Public Health on draft policies related to increased protection and conservation of groundwater and other drinking water supplies.

Groundwater Policy

Objectives

A key component of the comprehensive Groundwater Protection Program is effective policy and regulation that promotes protection of the county's essential groundwater resources. The King County Groundwater Protection Ordinance (KCC 9.14) created the Groundwater Protection Program, established a number of regulatory and policy elements within the program, and made the Department of Natural Resources and Parks the lead agency for implementation. As lead agency, the Department of Natural Resources and Parks has the following regulatory and policy responsibilities:

- Coordinate groundwater policy activities with state and federal agencies, tribes, local governments, and water purveyors and users; and participate in such activities as Endangered Species Act studies and other plans where groundwater may be an issue.
- Coordinate King County's groundwater policy activities internally with Public Health, the Office of Regional Policy and Planning, and the Department of Development and Environmental Services.
- Recommend possible changes in the areas of public health regulation, countywide planning policies, land use practices (such as critical recharge area protection) and tracking of groundwater trends.
- Develop comprehensive integrated policies around groundwater protection and include appropriate management policies for surface water, stormwater, wastewater and reclaimed water.

Major Regulatory and Policy Activities

Committee Membership: Appointments and Confirmations

In order to maintain active committee rosters, program staff worked with King County Council members, community groups and local governments to solicit nominations for new appointments to the Groundwater Protection Committees. Program staff provided support to the King County Executive and King County Council in the consideration, appointment and confirmation of committee members.

Salmon Recovery and Watershed Planning

In 2003, program staff worked with Water Resource Inventory Area (WRIA) Planning Committees to identify and investigate the groundwater-related aspects of salmon recovery and water supply planning. Projects such as the Sammamish River Valley Groundwater Project in WRIA 8 provide information that helps policymakers decide how best to protect groundwater and surface water for the benefit of salmonids and other species. Program staff also provided support to watershed planning efforts in WRIAs 15 (water supply planning for Vashon-Maury Island), 9 and 7 (salmon recovery planning), which focuses on water quantity and water supply, including in-stream flows and aquifer levels. In addition, program staff provided support on the Central Puget Sound Water Initiative, Governor Gary Locke's effort to develop a regional approach to water resources management.

Critical Aquifer Recharge Areas

Critical Aquifer Recharge Areas (CARA) are defined as Critical Areas under the state's Growth Management Act. Map 4 shows the county's new proposed CARA. This draft CARA designation was developed in 2003 as part of the county's larger review and proposed amendments to its Critical Areas Ordinance. State law requires King County to review, and update if necessary, its CARA provisions in order to ensure that the county is adequately protecting aquifers that are used to supply potable water. In 2003, DNRP staff evaluated the county's existing CARA code, developed draft amendments, and completed a Best Available Science review of the existing and proposed code. The Groundwater Protection Committees and other stakeholders were actively involved in this review, with each committee receiving at least three presentations on the CARA proposal as it evolved. Committee comments were instrumental in shaping the department's ultimate CARA proposal. The CAO was transmitted to the King County Council in March 2004, and is expected to be adopted by the end of 2004.

State Legislation

Program staff participated in King County's tracking and analysis of proposed state legislation. In 2003, key legislative activity that related to groundwater included tracking and commenting on legislation related to exempt wells and replacement wells.

Review of Policy Recommendations From Groundwater Management Plans

Program staff worked with the Groundwater Protection Committees to prioritize recommendations for King County policy changes or improvements. This review is part of the comprehensive review by each committee of its Groundwater Management Plan to determine which portions of the plan to implement, on a priority basis, and how to revise and update the plan. This area continues to be a major focus of 2004 committee work.

Interagency Coordination

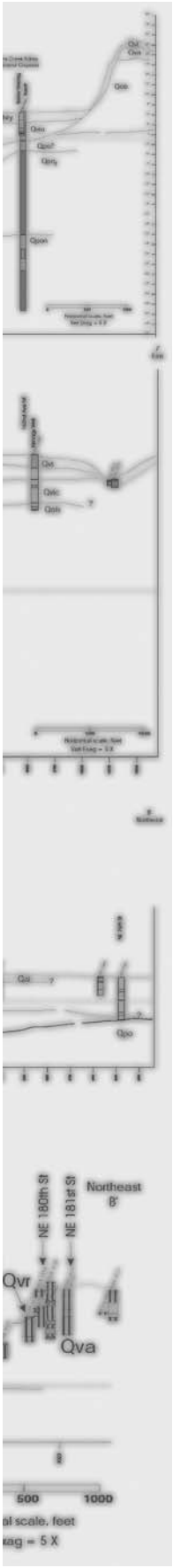
The success of the Groundwater Protection Program requires coordination of DNRP efforts with those of other agencies and entities. This coordination builds consistency across multiple jurisdictions and can help to achieve the goal of efficient and effective use of public resources, while providing valuable groundwater protection services to King County residents.

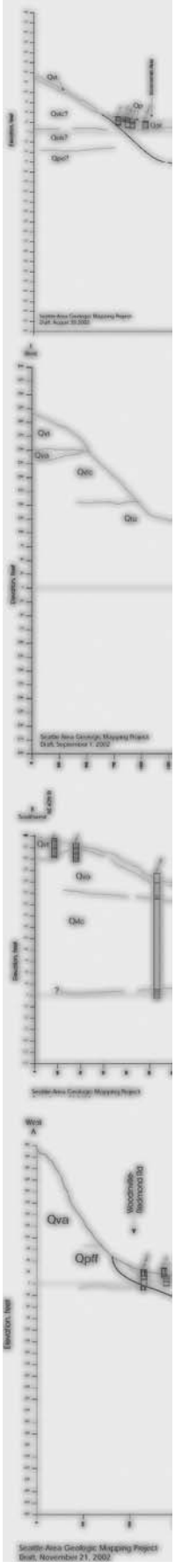
As lead agency for the Groundwater Protection Program, the Department of Natural Resources and Parks is responsible for interagency coordination activities, such as the following:

- Coordinating groundwater activities with state and federal agencies, tribes, local governments, water purveyors and users, and participating in such activities as studies and plans related to the Endangered Species Act where groundwater resources may be an issue.
- Coordinating groundwater-related departmental activities with the Wastewater Treatment Division, the Solid Waste Division, and the Water and Land Resources Division.
- Coordinating groundwater activities with other King County departments including Public Health, and Department of Development and Environmental Services.

King County Agencies

The Groundwater Protection Program is a cooperative effort between agencies within King County government. In some cases, the coordination involves a service such as a technical review for the Department of Development and Environmental Services, groundwater investigation work on a Wastewater Treatment Division project, or land surveying work by the Department of Transportation for a groundwater project. Often, coordination efforts result from overlap in services to the public. The goal is to reduce duplication and to coordinate and improve integration of the services.





Department of Natural Resources and Parks (DNRP)

In 2003, Groundwater Protection Program development, administration and policy was managed by the Water Policy Unit, within the Director's Office of the Department of Natural Resources and Parks. (In 2004 these services have been reorganized in the Water and Land Resources Division.)

Water and Land Resources Division (WLR)

Groundwater data collection, management and analysis efforts take place in the Scientific and Technical Support Area of the Science, Monitoring and Data Management Unit of WLR.

Groundwater outreach and public involvement is mostly performed in conjunction with other outreach efforts in the Land and Water Stewardship Services Unit of WLR. Program staff also work with other units of WLR, including: Basin Stewards, surface water monitors (stream gaugers), statistical and analytical laboratory services, Surface Water Engineering Services and Ecological Services, Drainage Investigation and Facilities Maintenance, and Regulations and Compliance.

Solid Waste Division (SWD)

Program staff coordinate with the Landfill/Environmental Unit of the Solid Waste Division's Engineering Services. The Water and Land Resources Division and the Solid Waste Division share the EQuIS database program and provide mutual support on technical issues, training and data sharing. SWD employees also participate in activities of the Groundwater Protection Committees. Through a partnership with the SWD, the Groundwater Protection Program developed a sampling and analysis plan for domestic water supply wells near the closed Duvall Custodial Landfill site.

Wastewater Treatment Division (WTD)

Program staff work on several projects with the Wastewater Treatment Division. The majority of the work relates to the Regional Wastewater Services Plan and includes monitoring and modeling projects such as the Green/Duwamish Water Quality Assessment and the Sammamish-Lake Washington Analysis and Modeling Project. Both projects require groundwater data and expertise. Additionally, program staff were involved in a technical review of the proposed Brightwater regional wastewater facility.

Department of Development and Environmental Services (DDES)

Coordination with this department primarily deals with projects that involve groundwater and require the State Environmental Policy Act review of plans and environmental impact statements. In 2003, program staff also worked with this department on evaluating the county's current regulations for Critical Aquifer Recharge Areas and developing proposed revisions to these regulations as part of a coordinated amendment to the county's Critical Areas Ordinance.

Department of Transportation (DOT)

The Groundwater Protection Program coordinates with King County's Department of Transportation in sharing data from a number of monitoring wells. This department's survey services provide accurate elevations and locations of monitoring facilities.

Water Resource Inventory Areas (WRIA)

Major resource management and protection activities are underway as part of the salmon recovery planning within each of the Water Resource Inventory Areas in King County. In 2003, program staff participated in the WRIA technical work related to the interface between stream flows and groundwater.

Public Health – Seattle & King County (Public Health)

One of the Groundwater Protection Program's most important partnerships is with Public Health. The two agencies share similar responsibilities. Public Health's concern is with the protection of potable water supply sources and the negative impacts from inadequate or unsafe groundwater (such as contamination). DNRP manages groundwater as part of its overall responsibility for protecting and preserving natural resources.

During 2003, staff at DNRP and Public Health met regularly to discuss overlapping issues between the two agencies. These included development and funding of the Operation and Maintenance Program for Public Health's On-Site Sewage (septic) Systems; re-evaluation of Management Strategies from the four completed groundwater management plans; discussions on scope, management structure and funding for the Groundwater Protection Program; and the sharing of groundwater quality and quantity data.

Local Hazardous Waste Management Program (LHWMP)

The Local Hazardous Waste Management Program is a multi-agency program including three King County agencies (WLR, SWD and Public Health) along with the City of Seattle Public Utilities and the Suburban Cities Association. The Groundwater Protection Program frequently coordinates with LHWMP on education, outreach and best management practices for handling and disposal of materials that pose a contamination threat to groundwater.

Auditor's Office

Program staff cooperated with the King County Auditor's Office as part of its functional audit of the program. This audit mandated by the Groundwater Protection Ordinance was intended to evaluate to what extent groundwater protection services were being provided by the program. In July 2003, the Auditor's Office issued a management letter to the King County Council reporting the findings of their audit. These findings were also presented to both the King County Council's Utilities Subcommittee and the Regional Water Quality Committee.

Prosecuting Attorney's Office (PAO)

Program staff and the King County Prosecuting Attorney's Office work together in support of each group's mandates. The program provides the PAO with expertise on legal matters concerning groundwater issues and the PAO similarly provides legal advice. In 2003, program staff worked closely with PAO staff to evaluate potential long-term funding sources for the program.

Metropolitan King County Council (KCC)

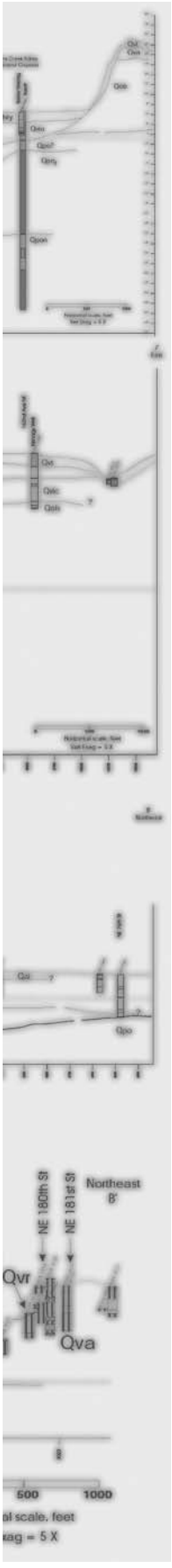
In 2003, the King County Council confirmed membership appointments to the existing Groundwater Protection Committees. The Council Utilities Committee requested and received presentations by program staff on the nature and status of the program. Program staff also provided similar information to the Regional Water Quality Committee.

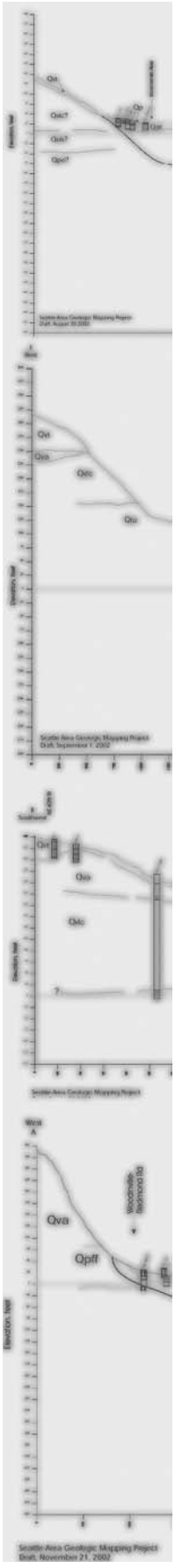
State Agencies

King County maintains partnerships with many other governmental agencies, particularly the state Ecology Department and Health Department.

Washington State Department of Ecology (Ecology)

The Washington State Department of Ecology has responsibility for managing the "waters of the state," which includes groundwater. Ecology's Water Resources Program maintains water rights and its Water Quality Program controls groundwater quality. Groundwater Protection Program staff work closely with Ecology on data and policy issues. This cooperation includes the following work:





- King County participates, along with the Department of Ecology, on the State Interagency Groundwater Committee (IGWC).
- King County negotiates with Ecology on the county's Surface Water Management National Pollutant Discharge Elimination System permit (this includes consideration of groundwater impacts from Surface Water Management facilities).
- King County works with Ecology on the review and certification of draft groundwater management plans.
- Ecology's Environmental Assessment Program assists on the Sammamish River Valley Groundwater Project through the placement of mini-piezometers (water level monitors) adjacent to the river.

Ecology is also represented with a non-voting member on each of the four Groundwater Protection Committees.

Washington State Department of Health (DOH)

Program staff work with the Washington State Department of Health on projects related to the state agency's responsibility for large ("Group A") public water systems across the state, and through participation in the IGWC. Through its water system water quality database, "SADIE," DOH also provides important data for the Groundwater Protection Program. DOH is also invited to have a non-voting member on each of the four Groundwater Protection Committees.

Local Governments

King County provides governance for the unincorporated portions of the county and is the provider of numerous regional services for the entire county. In 2003, many local cities participated in groundwater protection committees through designated representatives. Additionally, the cities of Redmond, Issaquah and Duvall shared the use of their water supply wells for ambient water quality sampling and data. Redmond made several wells and data loggers available as part of the Sammamish River Valley Groundwater Project. Redmond staff also shared information about the process for developing, and the content of, their new proposed Groundwater Protection Ordinances. The Auburn Public Works Department has coordinated with DNRP on its Well Head Protection Area delineation. Program staff worked with City of Issaquah staff in the development of Critical Aquifer Recharge Areas regulations.

Special Purpose Districts

The primary special purpose districts that the Groundwater Protection Program works with are water purveyors. Program staff continue to meet with a purveyor group on Vashon-Maury Island and have participated in a joint data-sharing program. Additional water districts have also allowed the use of wells for ambient water quality sampling.

Other Counties

Many other counties in Washington are developing their own programs to protect groundwater. In 2003, King County continued communications with Snohomish County, Whatcom County, Jefferson County, Thurston County, Mason County and Island County to share data, analysis methods, policy, and regulatory approaches. Snohomish County has been invited to participate in the East King County and Redmond-Bear Creek Valley Groundwater Protection Committees as aquifers in these areas cross into Snohomish County.

CHAPTER 3:
PROGRAM ADMINISTRATION AND ACCOUNTABILITY

As lead agency for the Groundwater Protection Program, the Department of Natural Resources and Parks is responsible for the following program administration and accountability activities:

- Provide support and serve as liaison to the Groundwater Protection Committees.
- Participate in implementation of the Groundwater Management Plans.
- Develop short- and long-term work plans for the program.
- Develop a long-term funding strategy to meet the needs of the program in cooperation with local jurisdictions, water purveyors, special purpose districts, and other interested parties.
- Provide reports and meet other commitments as provided in the Groundwater Protection Ordinance.

Program administration and accountability for 2003 is described below under three categories: Program Development, Internal County Reviews, and Budget and Staffing.

Program Development

Groundwater Protection Committee Liaison Services

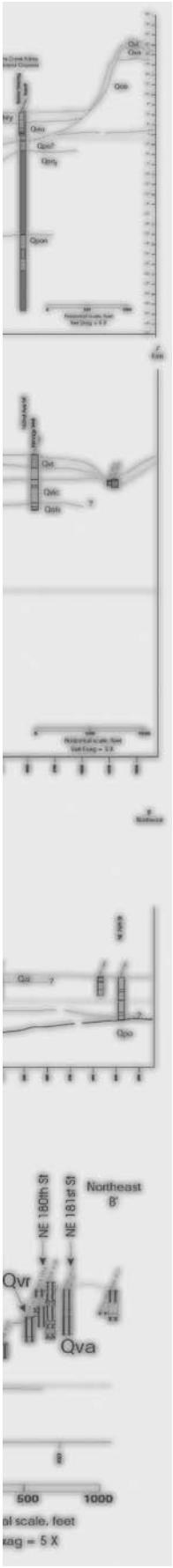
Groundwater Protection Program staff facilitated the operations of four groundwater protection committees in 2003. As liaison to the committees, program staff reported on county groundwater activities and solicited comment and feedback from committee members about the effectiveness of these activities. Additionally, program staff provided significant support to committee operations by scheduling meetings, reserving facilities, developing meeting agendas, taking meeting notes and serving as the contact point for distribution and receipt of key committee communications.

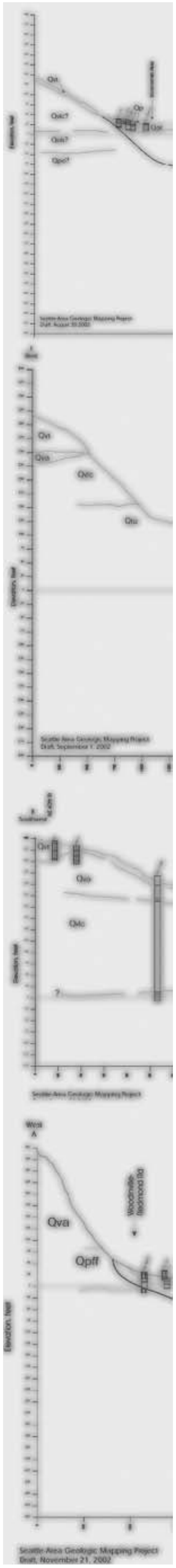
Groundwater Protection Plans

In 2003, program staff drafted an evaluation and status report on Management Strategies from each of the four completed Groundwater Management Plans. This task included soliciting status reports from Public Health – Seattle & King County, the Department of Development and Environmental Services, the King County Department of Natural Resources and Parks, the Local Hazardous Waste Management Program, and the King County Fire Marshal. The Washington State Department of Ecology, local cities and water purveyors also provided similar status reports for the management strategies for which they were named as the implementing agency. These combined status reports provided the foundation for the Groundwater Protection Committees' efforts to identify the top priorities for future actions by the implementing agencies.

Groundwater Program Work Plans

In 2003, program staff drafted work plans and shared them with an ad-hoc advisory committee whose membership included the chairs and vice chairs of all four Groundwater Protection Committees plus representatives from large groundwater purveyors whose service areas lie outside of the active groundwater management areas. Program staff worked closely with these advisors and the committees to assess what groundwater protection services are most needed in King County. In 2004, each committee will issue a formal statement about its priorities for future services as part of an update to its respective Groundwater Management Plan. These priorities will provide important direction for the future of the program and will aid in the development of a long-term, multi-year work plan and funding scenario.





Groundwater Services Funding

The Groundwater Protection Ordinance (KCC 9.14) states that the Program Lead Agency should research possible long-term funding sources for groundwater protection services. In 2002, program staff began evaluating a variety of funding options for feasibility and appropriateness. In 2003, King County hosted a number of meetings with the advisory group to discuss the scope of the Groundwater Protection Program and appropriate means for funding priority services.

The advisory group included chairs and vice chairs of all four Groundwater Protection Committees and representatives from large groundwater purveyors whose service areas lie outside of the active groundwater management areas.

Program Reporting

The Groundwater Protection Ordinance requires that both the King County Auditor's Office and the Regional Water Quality Committee review the program in 2003. (These reviews are described in more detail below.) Other 2003 reporting activity included the Groundwater Protection Program 2002 Annual Report (published in April 2003).

Internal County Reviews

The Groundwater Protection Ordinance called for two specific internal reviews in 2003. Program staff worked in partnership with staff from both the King County Auditor's Office and the Regional Water Quality Committee to initiate and complete these reviews.

King County Auditor's Office

The King County Auditor's Office was directed to review the delivery of groundwater protection services in King County and to provide an inventory of those services to the King County Council. Program staff worked with Auditor's Office staff to compile the inventory of services. The Auditor's Office management letter to the council reported on activity through spring 2003.

The King County Auditor's Office's letter, dated July 17, 2003, highlighted the accomplishments of the program:

> "The program appears to have been most successful in supporting the groundwater management committees, collecting and managing data, and participating in policy discussion where groundwater is a concern."

And the letter noted challenges of the program:

> "The program appears to have been less successful in resolving its funding constraints, developing work plans for groundwater management plan implementation, and coordinating efforts across agencies and jurisdictions."

The letter concluded:

> "…while the groundwater protection program appears to be offering services in line with its mandate, ongoing oversight may be needed to ensure that current challenges are overcome."

This review of the Groundwater Protection Program provided a valuable critique of the program in its second year. It highlighted program strengths and weaknesses experienced by staff working to implement elements of the Groundwater Protection Ordinance using existing resources. The Auditor's Office's letter was distributed to the council and presented to both the Regional Water Quality Committee and the council's Utilities Committee.

Findings of the review are consistent with the request by council to the Department of Natural Resources and Parks, Public Health – Seattle & King County, and the Department of Development and Environmental Services to prepare a proviso report to council by June 2004 describing inter-departmental coordination, program integration, and future funding options.

Regional Water Quality Committee

The Groundwater Protection Ordinance directed the Regional Water Quality Committee (RWQC) to make recommendations on the efficacy of the Groundwater Protection Program. The ordinance notes that the recommendations may include the following:

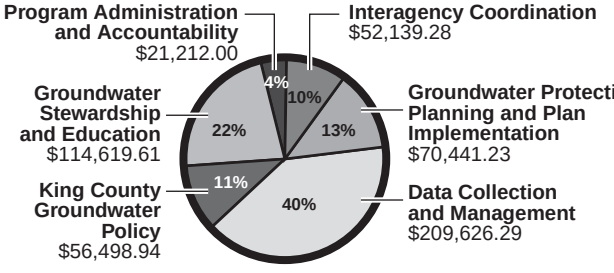
- public outreach, education and stewardship
- data management
- coordination of groundwater protection activities with all interested entities, users and individuals
- regional involvement in the groundwater protection program
- development of agreements and funding for regional groundwater protection services
- The role of the department of natural resources and parks in providing groundwater protection services.

In early 2003, RWQC staff met with staff from the Auditor's Office and the Groundwater Protection Program to discuss this pending review. RWQC staff chose to use the Auditor's Office letter as the foundation for their initial review. In September 2003, staff from both the Auditor's Office and the Groundwater Protection Program were asked to attend a routine RWQC meeting and to present findings from the audit and information regarding the status of the program and services being provided. Soon after, the RWQC recessed for the fall. It is anticipated that the committee will continue its review of the program in 2004.

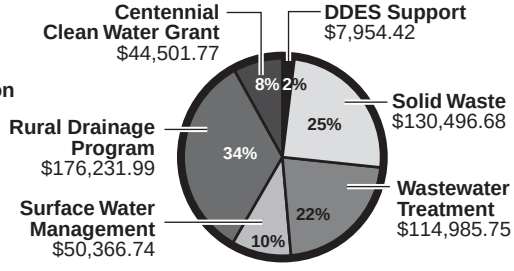
Budget and Staffing

The Groundwater Protection Program has existed in King County since 1989 when the Ground Water Management Areas were first identified under state law. Until 1996, program direction and management were centered in Public Health – Seattle & King County. Funding was based on state grant money, plus some contributions (mainly in kind) from purveyors in the Ground Water Management Areas. In 1996, the Groundwater Protection Program was moved to the Department of Natural Resources and Parks (DNRP). When the Groundwater Management Plans were completed in 1998, the King County Council provided DNRP with funding from the county's Surface Water Management fund for one full-time employee and less than $100,000. Since that time, the council has appropriated interim funding of approximately $800,000/year to DNRP, which has supported a program with up to 5.5 employees. In 2003, the budget was $937,397; however, expenditures were below budget due to staff vacancies. The expenditures and revenue distribution for the year are shown in the figures below.

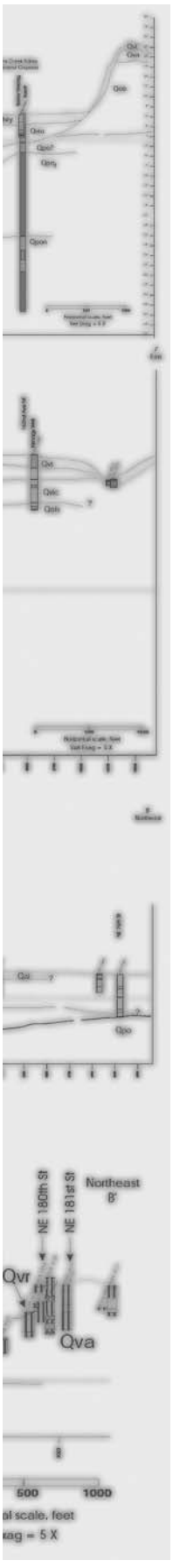
2003 EXPENDITURES
$524,537.35

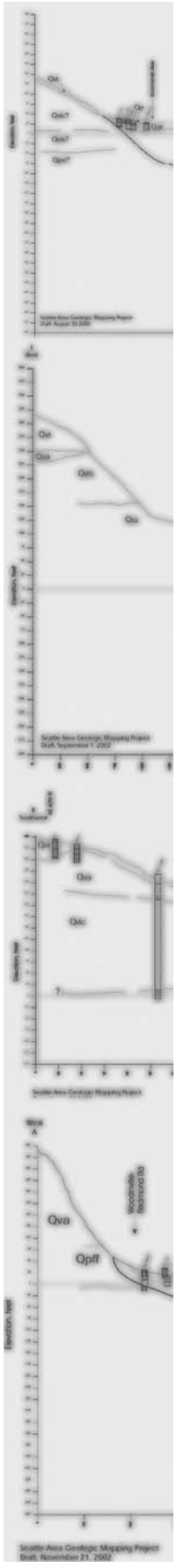


2003 REVENUE
$524,537.35



NOTE: percentages are rounded up.





Future Funding and Organization

Among the many elements of the Groundwater Protection Ordinance are clauses that direct DNRP, as lead agency, to evaluate and develop future funding for the program along with a program organizational structure that efficiently facilitates both cross and intra-departmental coordination.

In the fall of 2003, DNRP management reviewed preliminary staff recommendations for coordination and funding. At the conclusion of this review, departmental management decided to consolidate all DNRP groundwater program staff within the Water and Land Resources Division in order to improve staff coordination and to ensure that future funding options for the program are adequately represented in the division's 2004 business planning exercise.

DNRP management also directed Groundwater Protection Program staff to pursue funding for 2005 and potentially subsequent years through interlocal agreements with local partners by working through the Groundwater Protection Committees, pending completion of WLR's 2005 Business Plan. This direction is guiding part of the 2004 program work. In addition, the King County Council, in keeping with the Groundwater Protection Ordinance, directed DNRP, Public Health, and DDES via a budget proviso to report back to the council by June 15, 2004 on the status of groundwater protection services in each agency (see Auditor's Office section above.)

CHAPTER 4:
PREVIEW OF 2004

2004 Priority Projects

King County is providing many important groundwater projects and services in 2004. In general, the program will focus on providing tangible, on-the-ground services in response to local priorities. This will be the final year of the Groundwater Protection Committees as defined by the current Groundwater Protection Ordinance and the final year of the interim program funding as directed by the King County Council. Future options for similar committees will be considered within each committee's work program and service priorities.

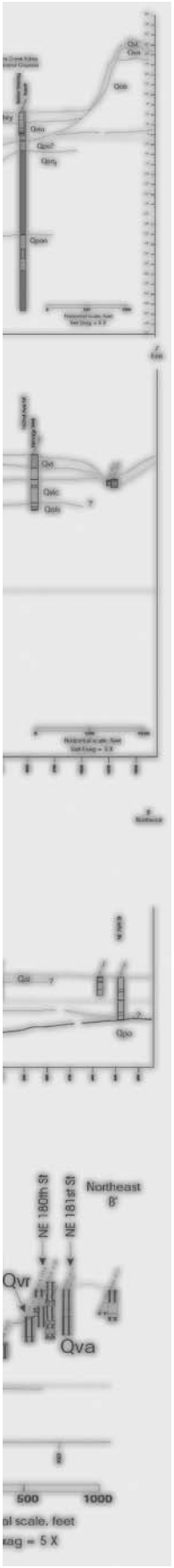
In 2004, program staff will focus on the following work:

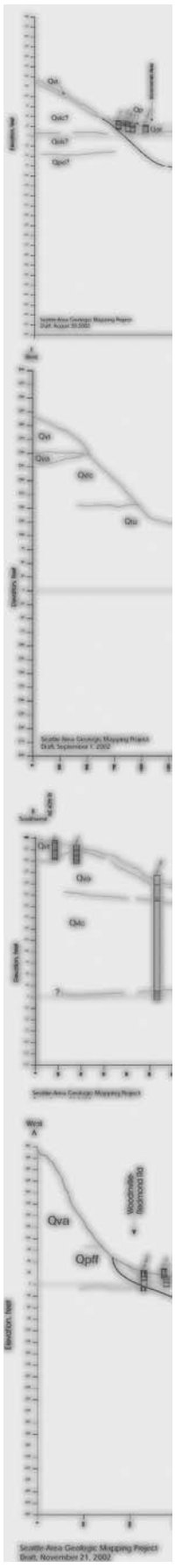
- Draft updates, in partnership with each Groundwater Protection Committee, to the four Groundwater Protection Plans.
- Develop a sCope of work specific to each Groundwater Management Area for 2005, and draft and negotiate interlocal agreements to fund this scope.
- Review South King County's Groundwater Management Plan and assist in its finalization and implementation (as resources allow).
- Design Groundwater Monitoring Programs to address area-specific needs.
- Implement the first year of a detailed water resources evaluation study for Vashon-Maury Island.
- Increase public access to Web-based groundwater data.
- Continue evaluation of existing King County groundwater regulations, including the proposed Critical Aquifer Recharge Areas, CAO amendments and proposed Comprehensive Plan amendments. Support Council adoption process as needed.
- Educate homeowners and businesses about how they can protect groundwater resources.
- Continue educational outreach in classrooms and at local festivals and events.

All above work will be pursued in 2004 in conclusion of the first phase of implementation under the Groundwater Protection Ordinance. The future of the program beyond 2005 will be directed by recommendations in the groundwater plan updates, new interlocal agreements, recommendations identified in the pending Water and Land Resources Division 2004 Business Plan, and potentially through new council directives.

The Department of Natural Resources and Parks, as lead agency for the program, is working closely with Public Health – Seattle & King County, the Department of Development and Environmental Services and the Local Hazardous Waste Management Program to identify appropriate groundwater protection roles for each of these agencies. These roles will be clarified, along with proposals for future funding of the Groundwater Protection Program, in the proviso report to be submitted to the King County Council on June 15, 2004.

The coming year will be critical for the key projects initiated in 2002 – such as the groundwater committees and groundwater monitoring – and it will be an essential year for solidifying direction and commitments for future groundwater protection activities.

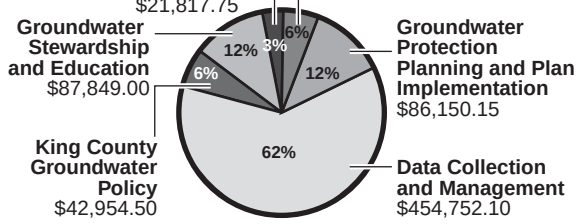




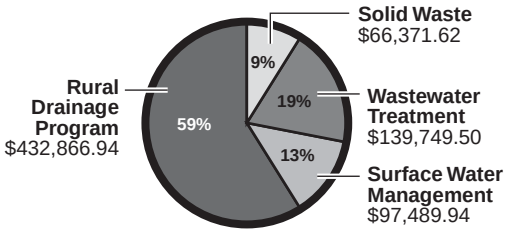
2004 Budget and Staffing

In 2004, staffing levels will be slightly less than 2003. There are five full-time employees budgeted for the program. The program budget for 2004 is $736,478. The figure below shows the anticipated expenditures and revenues for 2004. The program work plan and staffing may be modified during the year to respond to changing priorities and needs.

2004 BUDGET
$736,478.00



2004 REVENUE
$736,478.00



NOTE: percentages are rounded up.

APPENDIX A: GROUNDWATER MAPS

Map 1: Groundwater Management Areas and Well Locations

Map 2: Groundwater Monitoring Locations in 2003

Map 3: Susceptibility to Groundwater Contamination

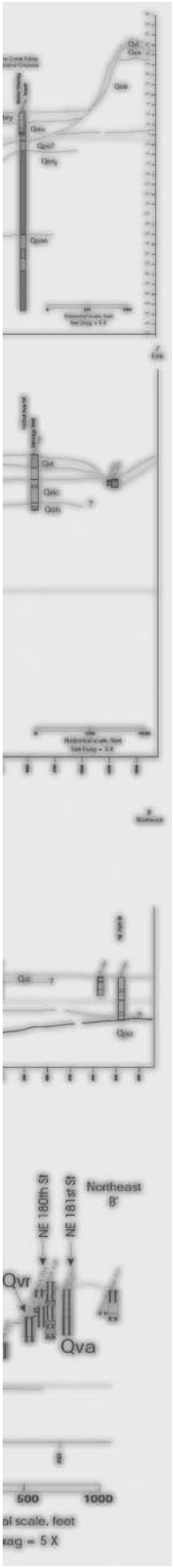
Map 4: Proposed Critical Aquifer Recharge Areas (CARA) 2004

Map 5: Groundwater Protection: Education and Public Involvement Locations

Map 6: Arsenic Concentrations

Map 7: Nitrate Concentrations

Map 8: Sammamish River Valley Groundwater Project



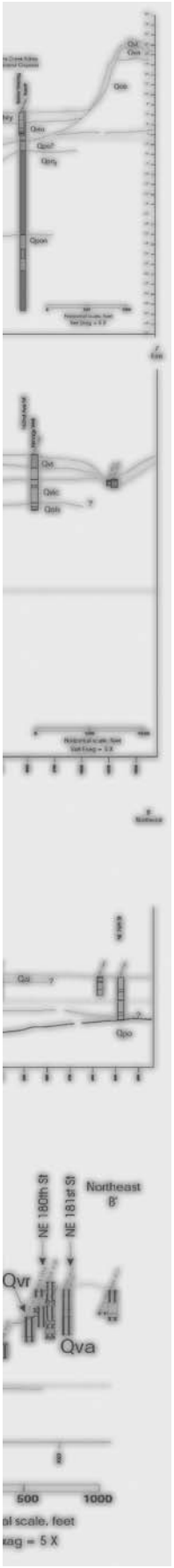
APPENDIX B: GROUNDWATER PROTECTION COMMITTEE STATUS REPORTS

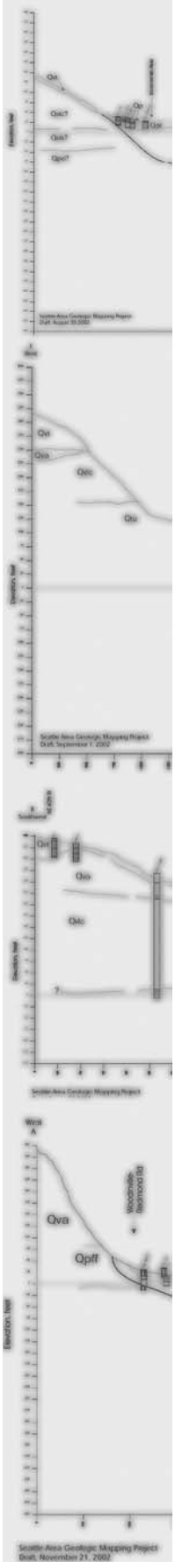
Vashon-Maury Island Groundwater Protection Committee

Redmond-Bear Creek Valley Groundwater Protection Committee

East King County Groundwater Protection Committee

Issaquah Creek Valley Groundwater Protection Committee





Vashon-Maury Island Groundwater Protection Committee

This committee, working closely with King County staff, held six meetings in 2003. Subcommittees on agricultural practices, groundwater warning levels and monitoring, land use compliance, low impact development, and septic systems did detailed work in their respective areas.

The following are key accomplishments for the year:

- Adopted a revised committee work plan.
- Served as an ad hoc advisory committee for the King County Vashon-Maury Island Watershed Steward.
- Provided recommendations to the county on potential Low Impact Development projects.
- Recommended to the county a 10-year water quality and quantity monitoring program, including warning levels, for the island. The recommendations included input from the state Department of Ecology and were essentially agreed to by the county.
- Participated in planning meetings for the county's Groundwater Protection Program.
- Reviewed Vashon-Maury Island Groundwater Management Plan recommendations in comparison to the existing county Comprehensive Plan and Regulations.
- Provided position paper with detailed recommendations on the county's draft Critical Areas Ordinance with regard to Critical Aquifer Recharge Areas.
- Provided educational materials via newspaper articles and community workshops.

2003 Committee Members

Emma Amiad, business owner

James Dam, residential well owner

James English, Vashon Chamber of Commerce

Ken Fulton, water purveyors, chairperson for Water District 19

James Garrison, original Groundwater Advisory Committee member

John Gerstle (committee chair), Vashon-Maury Island Community Council

Donna Klemka (committee vice chair), local environmental organizations

Martin Nyberg, commercial agriculturist

Others

Denise Andrews, Vashon citizen

Jack Barbash, Vashon citizen, scientist

Tom Dean, Vashon-Maury Island Land Trust

Joanne Jewell, Vashon citizen

Susie Kalhorn, Watershed Resource Inventory Area (WRIA) 9 representative

Joel Kuperberg, Vashon Forest Stewards

Yvonne Kuperberg, Vashon-Maury Island Community Council, Land Use and Natural Resources Committee

Michael Laurie (committee member nominee) business owner

Libby McLarty, Preserve Our Islands

Jeremy Pratt (committee member nominee) environmental consultant, WRIA 15 representative

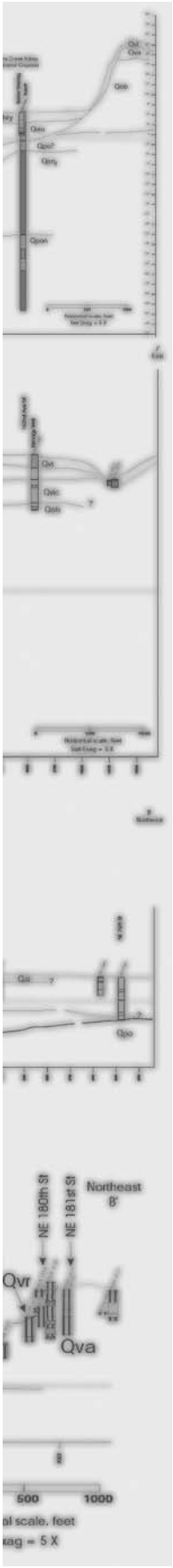
Lorin Reinelt, Vashon citizen

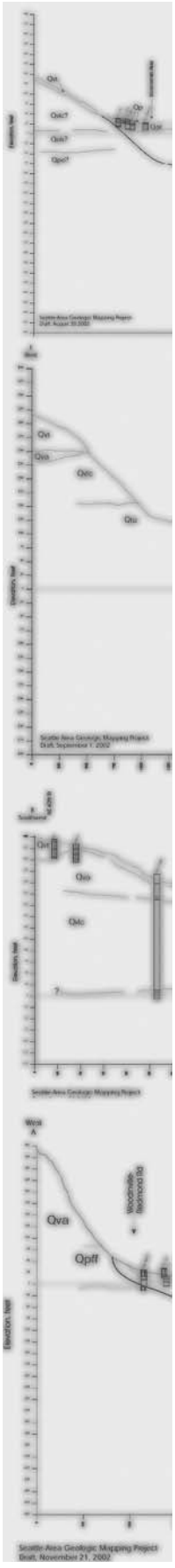
Tim Robinson, Vashon citizen, business owner

Kathryn Sposato, Vashon citizen, senior project manager for Amec Corp.

Edith Ulatoski, Vashon citizen

Doug Wood, Washington State Department of Ecology





Redmond-Bear Creek Valley Groundwater Protection Committee

Members of the Redmond-Bear Creek Valley Groundwater Protection Committee were appointed by King County Executive Ron Sims in September 2002 and confirmed by the King County Council in October 2002. Member terms that expired in 2003 were administratively extended.

The ordinance creating the King County Groundwater Protection Program (King County Ordinance 14214) requires that the committee provide an annual status report on its activity including the following:

- implementation of groundwater protection services in King County
- implementation of the certified Groundwater Management Plan (GWMP), including groundwater protection activities of the cities, special purpose districts, sewer and water utilities and associations, and groundwater purveyors within the Groundwater Management Area
- efforts to develop interlocal agreements relative to implementation of regional groundwater protection services
- trends in groundwater issues.

The committee held eight meetings and three subcommittee meetings in 2003. The highlights are as follows.

- Refined groundwater protection priorities and objectives, and established achievable goals.
- Completed a review of GWMP management strategies and area characterization.
- Identified areas of the GWMP that have been implemented.
- Decided to focus on the two highest priorities due to budget constraints. Selected education and data management as the priorities.
- Formed subcommittees to review GWMP recommendations and to provide updates for education and data management sections.
- Heard from King County, the city of Redmond and groundwater purveyors about existing data compilation and management efforts.
- Met with groundwater educators from municipalities and the county to identify areas for collaboration.
- Discussed local groundwater initiatives from cities, water districts and businesses.
- Drafted and adopted bylaws.
- Requested Chair Michael Johnson and Vice-Chair Gareth Grube continue in their respective roles through 2004.

The committee's structure and commitment to implementing the King County Groundwater Protection Program was confirmed in 2002. In 2003, an overview of the county's efforts, budget and capabilities was provided at a series of meetings with county staff. Through these meetings, it became apparent that the scope of the original GWMP exceeded budgetary capabilities. Tasks were prioritized, and the committee decided to focus on data management and education. The data management section of the GWMP has been updated, and the education section is currently being revised. The committee will turn its attention to implementing fully integrated data management and education programs, with municipalities and purveyors taking the lead within their jurisdictions, and the Department of Natural Resources and Parks assuming responsibility for unincorporated King County. Funding will be pursued through interlocal agreements. The committee hopes to have these agreements in place before December 31, 2004.

2003 Committee Members

Bertha Eades

Laura Szentes

Michael Johnson

Geoff Clayton

Joan Cabreza

Judy Jewell

Gareth Grube

Terry Lavender

Jon Spangler

Roy Bingman resigned from the committee in early 2003.

King County

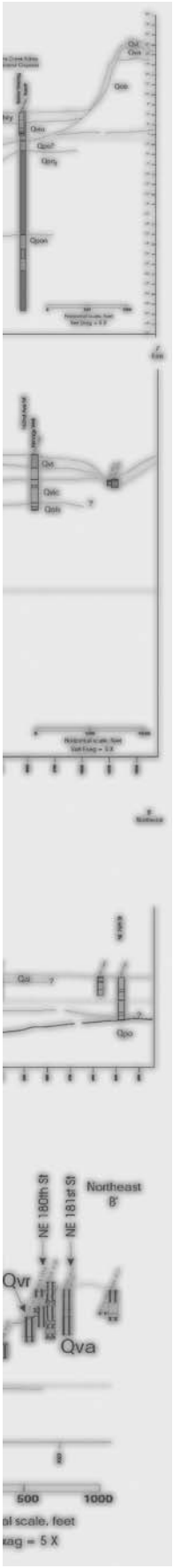
Sarah Ogier, Water and Land Resources Division, DNRP

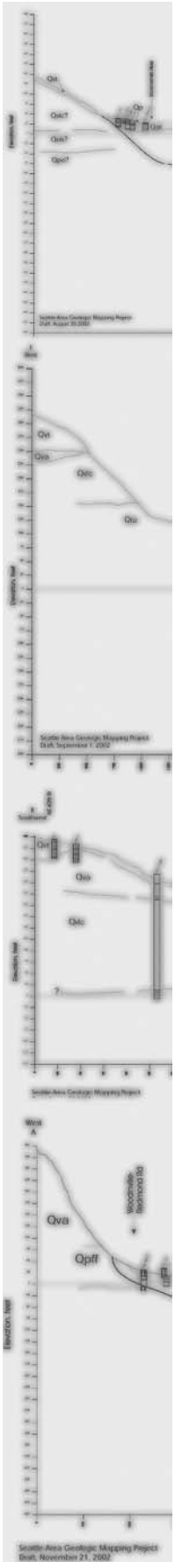
Ken Johnson, Water and Land Resources Division, DNRP

Stephanie Brown, Water and Land Resources Division, DNRP

Dave Monthie, DNRP Director's Office

Austin Polebitski, Solid Waste Division, DNRP





East King County Groundwater Protection Committee

Members of the East King County Groundwater Protection Committee were appointed by King County Executive Ron Sims in August 2002 and confirmed by King County Council in September 2002. The County Code creating the King County Groundwater Protection Program (King County Code 9.14) requires each of the Groundwater Protection Committees to provide an annual status report on the following:

- implementation of Groundwater Protection Services in King County
- implementation of the certified Groundwater Management Plan, including groundwater protection activities of the cities, special purpose districts, sewer and water utilities and associations, and groundwater purveyors within the groundwater management area
- efforts to develop interlocal agreements relative to implementation of regional groundwater protection services
- trends in groundwater issues.

2003 was the first full year of operations for the committee. Highlights from the committee's work in 2003 include the following:

- Held six meetings of the full committee.
- Adopted committee bylaws.
- Reviewed the management strategies recommended in the Groundwater Management Plan in light of current day issues and needs.
- Recommended specific modifications to certain aquifer protection management strategies.
- Reviewed status reports from each responsible entity regarding their progress to-date on each of the management strategies from the plan.
- Reviewed and commented on King County's proposed draft critical aquifer recharge areas ordinance.
- Developed new simplified categories for groundwater protection services.
- Developed and pursued a priority-setting exercise to select the most critical management strategies requiring action.
- Reviewed current state legislative activity pertaining to groundwater.
- Participated by representation in a countywide groundwater committee.
- Provided guidance to King County on 2004 work plan priorities and funding preferences.
- Provided direction to King County on priority educational messages and preferred techniques.

In 2004 the Committee hopes to complete its review of the plan and issue a report to implementing agencies to guide their provision of groundwater protection services.

2003 Committee Members

Chair: Dick Jones, past chair of Groundwater Advisory Committee Member

Vice Chair: Bob Pancoast, EKC Regional Water Association

Robin Boynton, residential well user

Terri Divers, Fall City Water District

Jim Dorsey, City of Carnation

Kirk Holmes, City of Snoqualmie

Terry Olson, Water District #119

Larry Stockton, City of North Bend

Matt Stone, business owner, Stone Construction

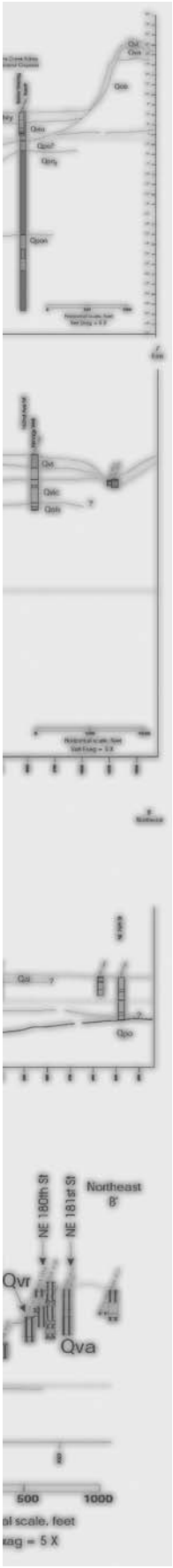
Jim Westlake, Snoqualmie Valley Chamber of Commerce, owner of Velocity Wireless

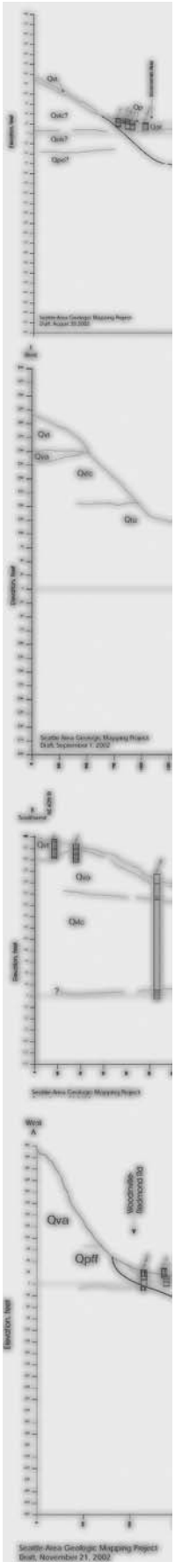
Others

Celia Kennedy, Seattle Public Utilities

Jalyn Cummings, Snohomish County

Andy Dunn, Department of Ecology





Issaquah Creek Valley Groundwater Protection Committee

The committee met for the first time in 2003. One challenge facing the committee is that the members do not have resource commitment authority for their respective agencies. Therefore, time was spent understanding the complexities of implementing the strategies contained in the Issaquah Creek Valley Groundwater Protection Plan. An examination of funding for the strategies since the report was originally published and funding of the activities of King County staff relating to these matters was a major focus. The committee's thoughts in this regard will be reflected in its final report by December 31, 2004.

The following are key accomplishments for 2003:

- Discussed activities that currently take place over the Lower Issaquah Valley Aquifer and the potential of those activities to contaminate groundwater resources.
- Identified activities that should not be allowed to occur over the aquifer and discussed means for protecting or mitigating such activities.
- Tracked progress towards completing the commitments of the original Issaquah Creek Valley Groundwater Protection Plan.
- Listened to reports by representatives of agencies undertaking similar groundwater protection activities within their respective jurisdictions.
- Provided King County with comments on the draft ordinance for the Issaquah Critical Aquifer Recharge Area (CARA), presented by the Issaquah Public Works Staff. This draft ordinance is based on the county's evolving CARA ordinance.

As the discussions occurred over the year, there was one clearly evident role for King County staff in the future – education. Groundwater resources meet the needs of a substantial portion of the regional community and, as such, must be given wider protection than local jurisdictions are able to provide. It is the opinion of this committee that the loss of any of the groundwater resources in any community would have a devastating effect on the entire county by straining any remaining resources. Therefore, the educational element of groundwater protection is one that rightly belongs with the county in order to facilitate consistency in the message being presented.

2003 Committee Members

Judy Passey, Mirrormont Water System/WA Water Service Co.

Ron Little (committee deputy chair), Sammamish Plateau Water and Sewer District

Elmer Green, Overdale Water Association

Ruth Kees, residential well user

Jim Stanton, Microsoft Corporation

Henry Thomas (committee chair), City of Issaquah

Forest Lane, Lakeside Industries and Chamber of Commerce

Barbara Shelton, Issaquah Environmental Council

Washington State Department of Ecology (ex-officio)

Washington State Department of Health (ex-officio)

Denise Smith resigned from the committee in 2003

KING COUNTY 2003 GROUNDWATER PROTECTION PROGRAM STAFF

Department of Natural Resources and Parks (DNRP) Program Staff

Sarah Ogier, groundwater program manager

Ken Johnson, groundwater technical team lead

Joel Massman, earth scientist

Eric Ferguson, water quality planner

Stephanie Brown, environmental scientist

Ray Eldridge, groundwater educator

Other Participating King County Staff

Dave Monthie, regional water policy analyst, DNRP Director's Office

Joanna Richey, Strategic Initiatives section manager, Water and Land Resources Division (WLR), DNRP

Jim Simmonds, groundwater technical team supervisor, WLR, DNRP

Donna Kalka, groundwater education supervisor, WLR, DNRP

Isabel McClure, engineer, Solid Waste Division (SWD), DNRP

Laura Belt, engineer, SWD, DNRP

Tom Theno, engineer, SWD, DNRP

Austin Polebitski, engineer, SWD, DNRP

Katy Vanderpool, Vashon-Maury Island Basin Steward, WLR, DNRP

Additional Support for Annual Report Production

Megann Devine, design and cartography

Constance Carlson, mapping

Saffa Bardaro, editing

Margo Carn, editing